

CHAPTER 2 CLIMATE AND MATERIALS

INTRODUCTION

Climate change is a serious threat, but we know what we need to do

Climate change is the greatest environmental challenge of the 21st century and so deserves some special focus in this handbook. Climate change poses a serious threat not just to Oregon’s natural treasures — forests, mountain snows and rivers — but also to our jobs and our health.

The good news is that working to address climate change also presents huge opportunities. Money can actually be saved and made during the transition to a low-carbon community. The Portland metro area is a global leader in that transition, and we have an unparalleled opportunity to make the switch in ways that create jobs and benefit all residents.

Scientists expect that, should we fail to curb climate change, Oregonians in the future may see more intense heat waves, droughts, rainstorms, floods, wildfires and landslides. These impacts could drag down Oregon’s economy, stress our natural resources and worsen inequities.

When we protect the climate, we win

When we work to protect our climate, good things happen. Local businesses innovate and create jobs. Residents and businesses save money that they can then spend locally. Our community gets healthier and our neighborhoods become more vibrant.

When people in our region reduce the energy we need to power our homes and businesses, invest in renewable energy, make smart decisions about urban development and transportation, and consider climate change risks in decision-making, we see:

- Better air quality and improved human health.
- New jobs and greater reinvestment in the local economy.
- Lower energy bills.
- Shorter commute times between home, work and school and more opportunities for people to walk, bike or take public transit.
- Less damage to social and environmental systems due to drought, floods and fire, and fewer disruptions in services.



DEEP DIVE

For more on potential local area ramifications to climate change visit the City of Portland Climate Preparation Strategy (available online).

We're adding too much carbon to our atmosphere

The world's scientists have concluded that carbon emissions from human activities have begun to destabilize the Earth's climate. Carbon emissions from fossil fuels and land use changes, including deforestation, are primary drivers of climate change today and in the future. Emissions of methane from cattle and landfills also make significant contributions. Simply put, we're adding too much carbon to the atmosphere by burning fossil fuels like coal, natural gas and gasoline. The magnitude of future climate impacts depends largely on the trajectory of future global carbon emissions.

MATERIALS AND CLIMATE

Materials management is important

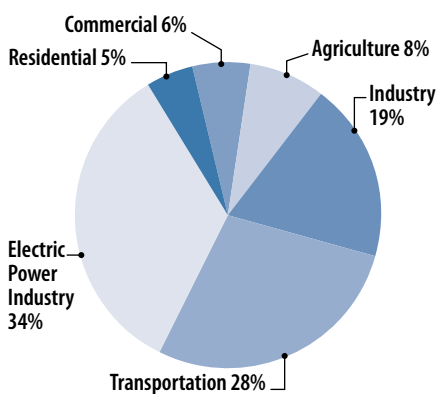
While most of the public knows that the transportation and energy choices we make are important to curbing climate change, studies show that the average consumer does not associate consumer goods and food choices with climate change. When addressing climate, programs, plans and climate action outreach tend to focus on transportation and energy used in buildings. This chapter will explore why materials management matters for climate protection.

While public perception research shows that it may not be effective to begin a conversation about reducing, reusing or recycling by talking about climate change, this topic will come up, and it is helpful to be prepared to speak about it. Meanwhile a growing portion of the public is becoming alarmed about this global problem and will sometimes mistakenly decide that materials management is a distraction from the action that they urgently believe must be taken to save the planet. Master Recyclers can help respond to concerns about climate change and help give people hope that we can still mitigate the impacts of climate change, in part by changing how we extract, produce, consume and dispose of materials.

National, state and local governments inventory where emissions come from in order to identify priority areas to change our practices.

To identify where we burn fossil fuels, climate experts have traditionally divided carbon emissions into economic sectors: You can see by the graph to the left that they are divided into residences, businesses, agriculture, industry, transportation and electrical power. This inventory process has led governments to believe that the best strategies to reduce carbon emissions pertain to how we heat and power our homes, businesses and factories and how we get around. The connection between materials and climate was not intuitively obvious because emissions associated with materials were spread throughout all of the sectors.

TRADITIONAL ECONOMIC SECTOR-BASED VIEW OF U.S. GREENHOUSE GAS EMISSIONS



Source: U.S. EPA (2009)

In 2009, however, the EPA shifted the emissions inventory to better identify the actual activities that cause emissions. They called this new inventory a systems-based view of U.S. greenhouse gas emissions (GHG), where each system represents and comprises all the parts of the economy working to fulfill a particular need. For example, the provision of food system includes all emissions from the electric power, transportation, industrial, and agricultural sectors associated with growing, processing, transporting, and disposing of food. The systems view is helpful for framing opportunities to reduce GHG emissions through prevention-oriented mitigation strategies that act across an entire system.

The resulting report confirmed that lighting, heating and cooling buildings contribute 25 percent of our domestic emissions, and therefore green building is important. It also confirmed that moving people around contributes 24 percent, so transit and types of fuels are priorities.

What was new and surprising to some was that the EPA report showed that about 42 percent of U.S. greenhouse gas emissions are associated with the energy used to produce, process, transport, and dispose of the food we eat and the goods we use. This includes the extraction or harvest of materials and food, the production and transport of goods, the provision of services, reuse of materials, recycling, composting, and disposal. The report also indicated the following:

- 29 percent of U.S. GHG result from the provision of goods produced within the United States.
- The provision of food contributes another 13 percent of U.S. GHG emissions.
- Landfilling and incineration represents 1 to 5 percent of U.S. GHG emissions.

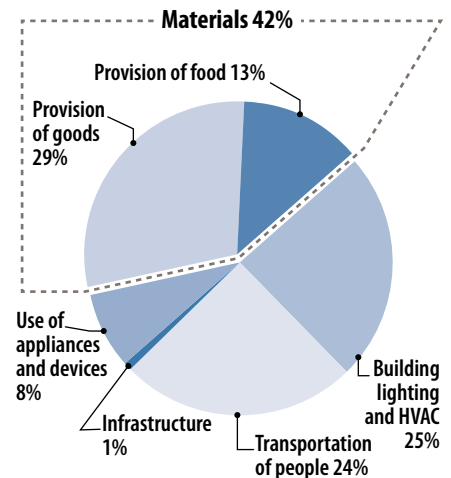
Note that the U.S. GHG emissions presented in these two graphs represent emissions that are released domestically. Emissions associated with extraction of raw materials, processing, and production of goods and services outside the United States, but consumed in the United States, are not captured in the EPA Inventory, and therefore are not reflected here. Correspondingly, the emissions associated with goods and services produced in the United States that are exported for consumption in other countries are not included. If U.S. emissions were calculated using a total life cycle perspective, based on goods and services consumed rather than produced in the United States, the emissions associated with materials management would be greater than is shown due to the large quantity of imported goods consumed in the U.S.

Oregon engaged in a related effort, estimating the global emissions associated with consumption by Oregonians no matter where the product was made. And we've come to similar conclusions: When viewed through the lens of consumption, Oregonians contribute more to climate change as a result of purchasing stuff, than we do by driving our cars, or heating and powering our homes.

DEEP DIVE

For more information you can consult the EPA's report *Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices* (available online).

MATERIALS MATTER: SYSTEMS-BASED GEOGRAPHIC EMISSIONS INVENTORY



Source: U.S. EPA (2009)

These new approaches to calculating carbon emissions led local governments to shift priorities to include materials management as part of the suite of solutions that will be necessary.

OREGON'S CLIMATE IS CHANGING

Climate change presents an unparalleled challenge.

Human influences on climate, already apparent at the global and continental scales, are altering the social, environmental and economic systems we rely upon. In the Pacific Northwest, these changes threaten agriculture and water sources, power supplies, public safety and health, forests and local economies, all of which have substantial impacts on quality of life. Observed regional temperature, snowpack, snowmelt timing and river flow changes are consistent with projected trends.

Over the past 30 years, average temperatures in the Pacific Northwest have generally exceeded the 20th-century average, and the region has seen a temperature increase of about 1.3 degrees Fahrenheit.

Over the past 50 years, increases in winter temperature have contributed to the decline in snowpacks in the Pacific Northwest, including in the Clackamas River basin. Glaciers have diminished, a trend expected to continue through the next 100 years. In particular, Mount Hood's glaciers have decreased in length as much as 61 percent over the past century.



DEEP DIVE

For more on the changes expected in our region visit the City of Portland's Climate Preparedness Plan (available online).

These changes are costly

Warmer temperatures and more extreme heat events are expected to increase the incidence of heat-related illnesses (for example, heat rash, heat stroke) and deaths. A recent study projected up to 266 additional deaths in the greater Seattle area among persons 65 and older in 2085 compared to the annual average for 1980–2006. In Oregon, the hottest days in the 2000s resulted in about three times the rate of heat-related illness compared with days 10 degrees Fahrenheit cooler.

The physical impacts of a changing climate are accompanied by social challenges. In particular, low-income households face disproportionate impacts of climate change. Exposure to heat stress in homes without air conditioning, for example, while having fewer resources to respond to these changes. Rising energy prices compound the situation and have the potential to further exacerbate existing social disparities.

Climate change will affect natural systems and watersheds across the Portland region. Changes in precipitation patterns affect streamflow, groundwater recharge and flooding, and may increase risks of wildfire, drought, and invasive plant and animal species. Increasing surface water temperatures affect resident and migratory fish and wildlife species and their habitats, threatening their long-term survival.

Native American leaders in the Portland metropolitan region have also been vocal in stating that climate change will have complex and profound impacts on their communities, many of which have deep historic and current ties to the land's resources. For example, treaty-protected fish species may become threatened or less accessible to tribes due to impacts on water quantity and quality that affect salmon and other fisheries.

CONCLUSION

The good news is that there has been important progress and many new voices have joined the call to action.

International religious leaders are beginning to characterize climate protection as a moral imperative. In particular, Pope Francis has been remarking how the environmental degradation caused by climate change disproportionately affects the world's poorest people. Pope Francis has also been linking climate change to the massive movements of people and increased human trafficking.

Islamic leaders have also prompted faith communities to take action to halt the desecration of nature that leads to destruction of creation, human and otherwise. In summer 2015, they launched the *Islamic Declaration on Climate Change*.

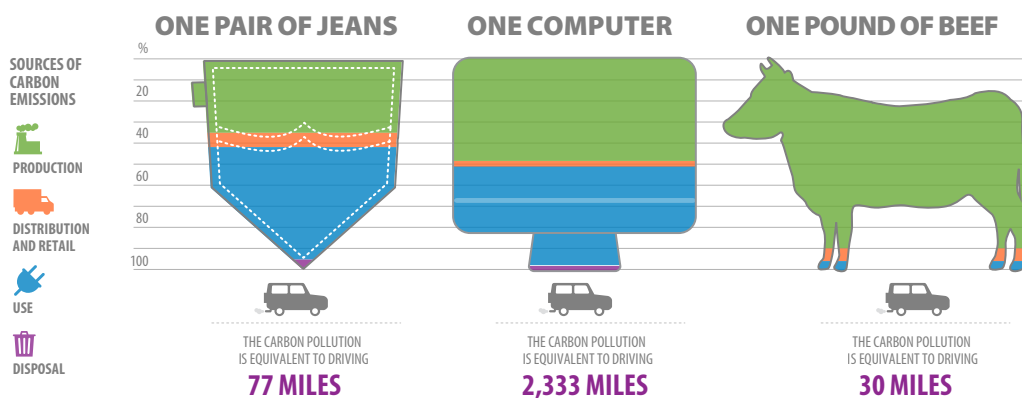
On a more local level, the State of Oregon passed its Material Management plan in part to address climate. Metro also worked on regional planning for transportation, land use and landfill management in order to address climate change.

It can be discouraging to hear about the devastating effects of climate change. Many people doubt that it's still possible to turn climate change around. But the City of Portland and Multnomah County have proven that it is possible to change the momentum of emissions. In 1993, Portland was the first city in the country to adopt a climate action plan with a roadmap of action items. They've already reduced carbon emissions by 19 percent since 1990, while the population has increased by 39 percent and they have 36 percent more jobs. Furthermore they have a plan for continuing to reduce emissions that will also improve our economic, social and cultural lives.

Action is required at all levels to build low-carbon communities. Each person, each business, each government agency has a part to play. Whatever you decide to focus on in your volunteer efforts as a Master Recycler will ultimately be related to this larger global effort.

IT TAKES ENERGY TO MAKE THE THINGS WE BUY AND USE EVERY DAY

And most of that energy comes from carbon polluting sources.
From farm or factory to your home, buying something costs more than just money.



So, what CAN we do? Wash jeans in cold water and line dry. Turn off computer when not in use and have it repaired rather than buy a new one. Try eating lower carbon foods, such as vegetables, grains or chicken.